

The rapid draining of 500 cubic-mile Glacial Lake Missoula, probably in only a few days, resulted in a maximum discharge across the Columbia Plateau 10 times the combined flow of all the rivers of the world today. The floodwaters of the lake rapidly shot south-westward down the length of the present sites of Pend Oreille and Coeur d'Alene Lakes and the Rathdrum Prairie - Spokane Valley area and out across the Columbia Plateau and beyond. Attaining speeds estimated to be as great as 45 miles per hour, the water swept across the Columbia Plateau, through the Pasco and Umatilla Basins, down the Columbia River Gorge, and eventually into the Pacific Ocean beyond the Coast Range. The floods occurred repeatedly at least 40 times.

The most prominent testimony to the cutting power of the floodwaters is observed clearly today in the numerous coulees carved into the basalt surface of the Columbia Plateau, forming an area of unique topographic relief known as the Channeled Scablands. Other features that indicate the magnitude of the flood event and the amount of rock debris carried and dumped along the flood's pathway include giant current ripples and gravel bars. Some gravel bars are more than 50 feet high and 500 feet between crests, and they are found today along much of the flood's course, from the valleys of western Montana to the lowlands along the Columbia River beyond the Cascade Range. Along its journey to the ocean, at various reaches where the river valley

narrows, the floodwater was impounded temporarily by restrictions and formed several large temporary lakes.

In passing through the Rathdrum Prairie-Spokane Valley area, the floodwaters carried large volumes of rock debris in the masses of ice broken from the glacier's terminus, which included large boulders that came from the mountains farther north. The flood carried great quantities of sediment of all sizes, from clay particles to large cobbles and boulders, picked up from the flood channels. The heavier, large materials, such as boulders, cobbles, and coarse gravel, dropped out of the water first. These coarse materials were deposited along the main valley in the line of greatest flow and velocity;

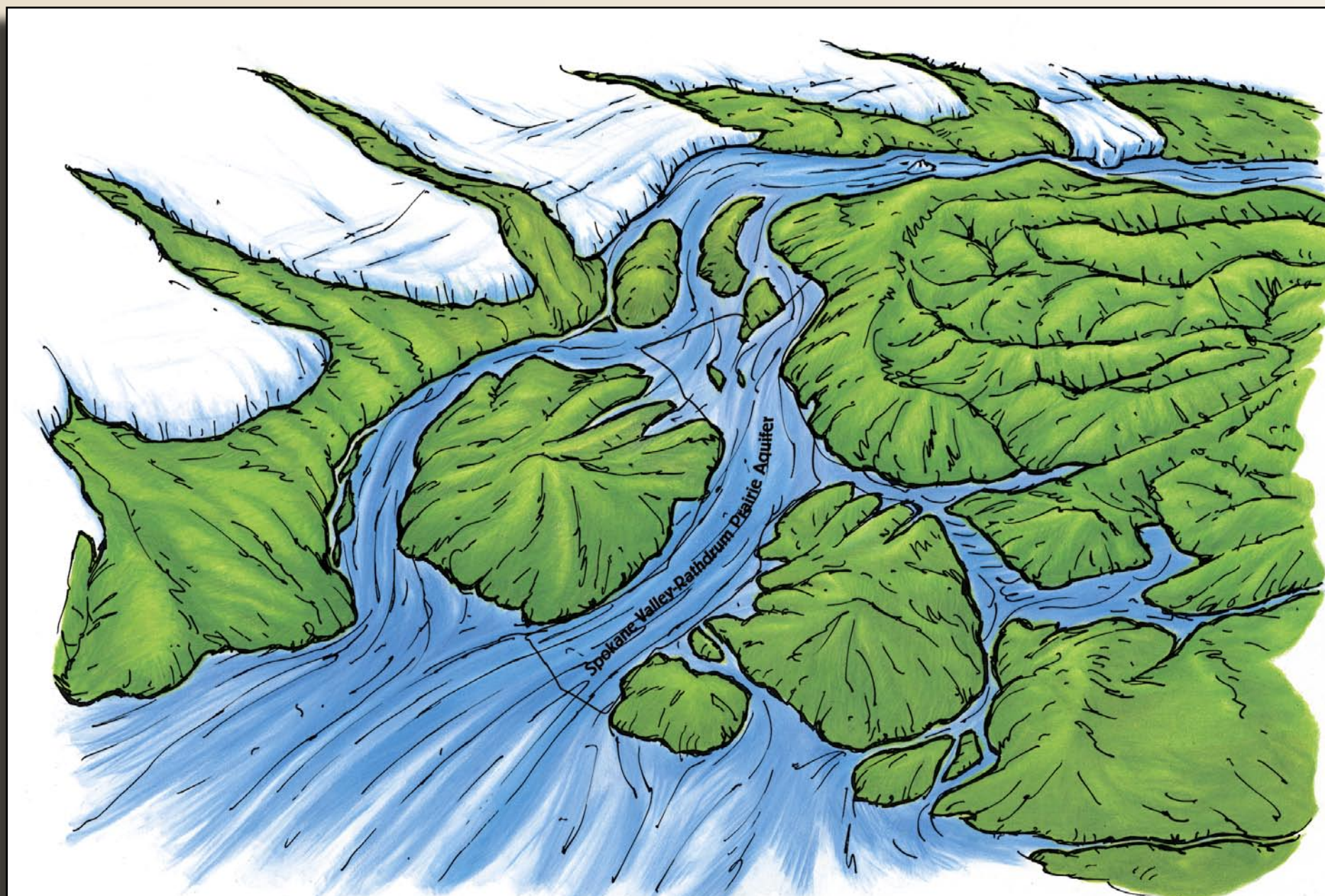
much of this sediment was deposited on top of the previously accumulated normal glacial outwash silts, sands, and gravels. Some of the smaller particles in these earlier outwash materials were washed out and carried in suspension; then eventually either deposited in side eddy valleys, such as the Hillyard Trough, or carried out onto the Columbia Plateau and beyond. The coarse materials today underlie the Rathdrum Prairie-Spokane Valley lowland. Some isolated localities contain boulders as much as 8 or 10 feet across.

The subsidence of the floodwaters following the final emptying of Glacial Lake Missoula was followed by a gradual northward retreat of the Cordilleran Ice Sheet, and, eventually, during recent time, the region acquired its present aspect and drainage system. After the disappearance of the ice from the Pend Oreille Valley, the Clark Fork River drained through Pend Oreille Lake and then west and north to the Columbia River. To the east, the Coeur d'Alene, St. Joe, and St. Maries Rivers drained to Coeur d'Alene Lake, the source of the Spokane River. The broad, flat, gravel filled flood pathway between Lake Pend Oreille and the Spokane Valley became virtually devoid of a surface drainage system, with streams from side valleys flowing only short distances before sinking into the coarse materials. The Spokane River resumed its course westward to

Spokane; then, instead of flowing north through the Hillyard Trough, which now had a higher surface created by flood deposits, the river followed a new, lower course along the margin of the Columbia Plateau lava to its confluence with the Columbia River.

A few small lakes were created in the lower parts of tributary mountain valleys. These lakes are held in their basins by the finer-grained deposits laid down along the edges of the valley where flood velocities were low. They include Spirit, Twin, Hauser, and Newman Lakes on the lower east and south flanks of the Spokane Mountain area, Hayden Lake at the base of the Coeur d'Alene Mountains, and Liberty Lake below Mica Peak. Discharges from the lakes percolate rapidly into the main valley gravels, and only a few short stream channels exist.

As the climate became warmer, vegetation developed over the area. Eventually coniferous forests covered parts of the adjacent uplands and mountains, and cottonwoods and other deciduous trees, along with small groups of conifers, lined the river channel. The valley floor and nearby slopes became covered by grasses and other small plants. This was the Spokane Valley-Rathdrum Prairie area as inhabited by Native Americans when first visited by the early white explorers, fur trappers, and traders (see page 3).



Ice Age Flood Facts

Most of Lake Missoula, about 500 cubic miles, drained in a few days.

The maximum flood discharge was estimated as ten times the combined flow of all the rivers in the world today.

The floods occurred at least 40 times.

The flood velocity over the Columbia Plateau is estimated at 45 miles per hour.

The flood carried boulders as large as 8 to 10 feet across to the Spokane Valley - Rathdrum Prairie region.